AMERICAN
GAS JOURNAL
Established 1859 Pioneer of the Gas Industry

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NEW YORK, SATURDAY, JUNE 20, 1925

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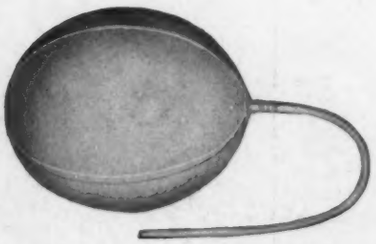
Our Gas Main Bags *Can't Slip!*

Where the emergency demands a stoppage of gas in the mains, there must be no halfway measures; *the gas must be fully and completely cut off at the point desired.*



This is the function which Safety Gas Main Stopper Bags perform. The structure of the bags is such that a 12" bag may be inflated to an internal pressure of *fifteen* pounds — and it *can't slip*. The expansion is full and the flexibility of the bag readily adjusts itself to any inequality in the main.

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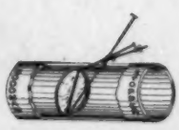
TYPE A—Invisible Seams or Seamless Bags.
TYPE B—Reinforced Seams—heavier and stronger than Type A.
TYPE C—Canvas Covered Bags for use in mains. Coated with tar or oil.
When ordering specify type desired.

THE IMPROVED GOODMAN STOPPER

A Reliable Gas Main Shut-off



For quick work and a reliable non-leak shut-off, nothing excels the Goodman Stopper. To make it doubly secure the Goodman is equipped with a patented Positive Locking Sleeve which locks the handles to the pipe with such tenacity the stopper cannot budge.

SAFETY GAS MAIN TAPE

Soap Tape and Binding Tape

These two essentials belong in every emergency outfit for temporary and immediate repair work on mains and services. A generous stock kept in the storeroom puts you several jumps ahead of a big gas loss.

SAFETY GAS MAIN STOPPER CO.

523 ATLANTIC AVENUE — BROOKLYN, N. Y.

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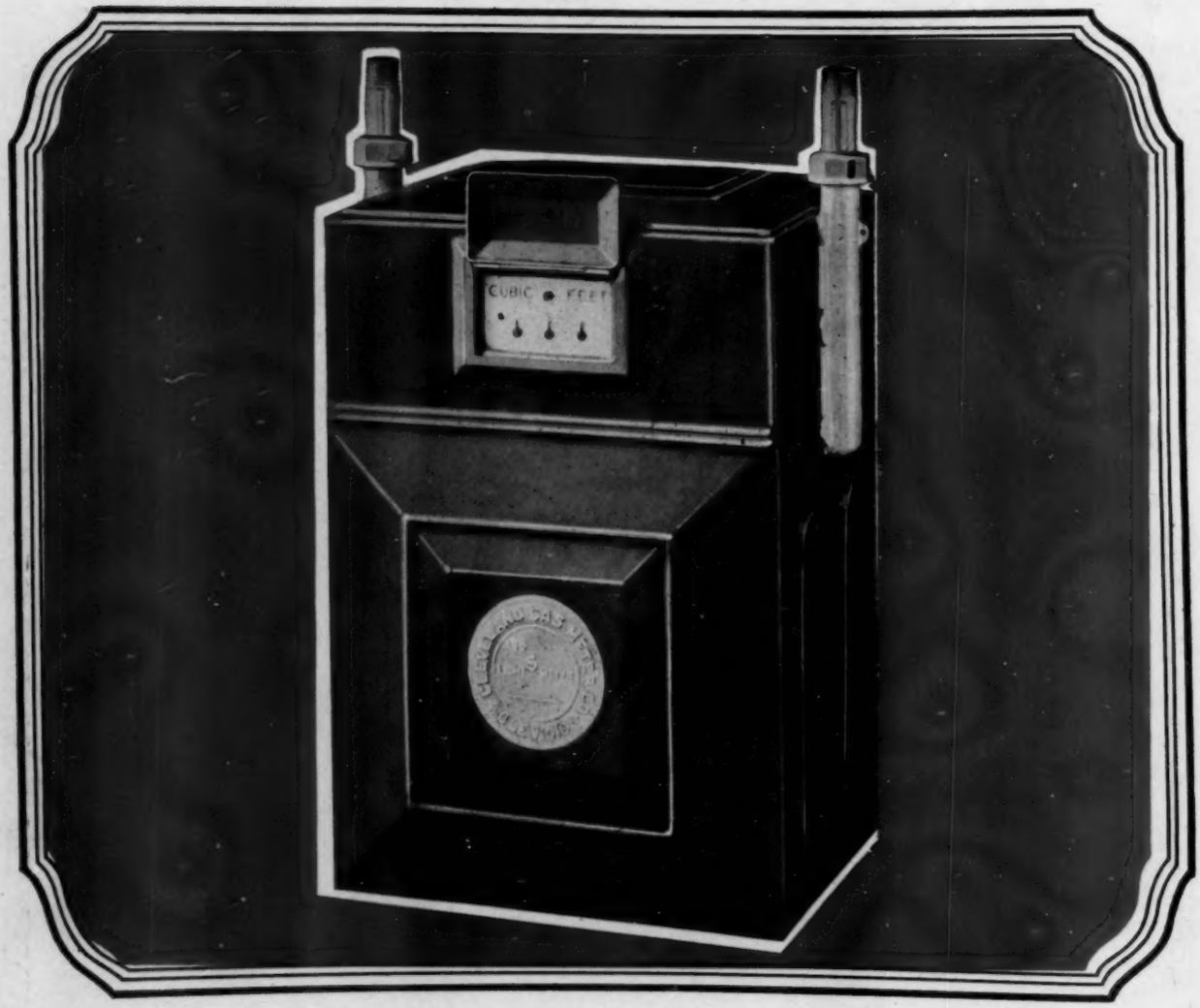

Dependability in a gas meter means a constant measure of reliable service; this is appreciated by the Superintendent, the Meter-reader and the Consumer.

Cleveland Gas Meters have a reputation for dependable service, the result of over thirty years' experience in manufacturing.

Our thoroughly organized and completely equipped factory assure you that the workmanship, materials, accuracy and general efficiency are unequaled.

"A" and "B" Types Meter Repairing

CLEVELAND GAS METER COMPANY

2180 East 65th Street **Cleveland, Ohio**

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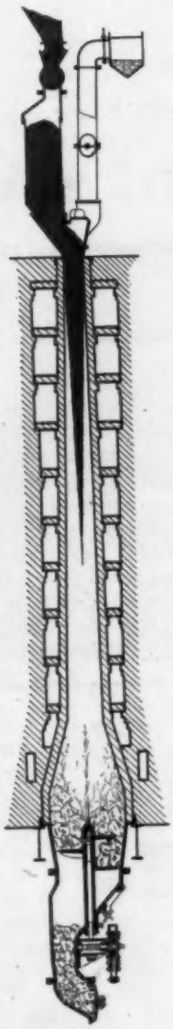
Vertical Retorts

American Installations



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Pawtucket, R. I.
Portland, Me.
Ottawa, Ont.
Montreal, Que.
Fitchburg, Mass. (Repeat)
Pernambuco, Brazil
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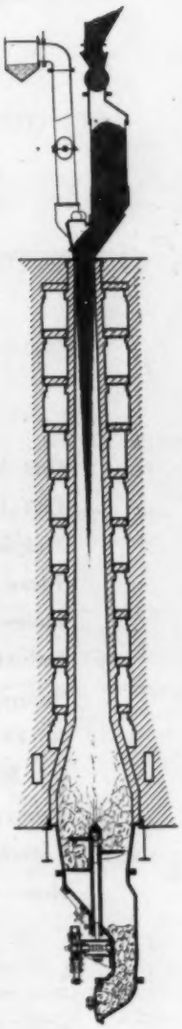

WEST GAS IMPROVEMENT CO.
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American Gas Journal

SIXTY-SIXTH YEAR

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"MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS"

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AMERICAN
GAS JOURNAL

Vol 122. No. 25 NEW YORK, JUNE 20, 1925 Whole No. 3525

Gas In the Chemical Industries

Heating methods and general practice in chemical plants

Joseph Jares

The Brooklyn Union Gas Company

ONE of the most interesting fields in which the industrial gas engineer can find new uses of gas is the chemical industry. Following the recent expansion of chemical industries in this country, with world-wide demand for high quality products, our chemists have been called upon to produce the high-grade materials. Inasmuch as heat, in some form or other, is always employed in chemical processes, it becomes necessary for them to select a suitable fuel for their operations. Gas, being a high quality fuel, deserves the first consideration where a high quality product is to be manufactured.

All chemical reactions are governed by well known physical and chemical laws which must be adhered to without the slightest deviation in order to carry out the desired reactions to a successful completion. An absolute control of temperature and of the proper rate of application of heat are essential. Many a batch of perfectly good material goes to waste just because it is not heated at the correct rate, or because it is overheated a few degrees. With gas as the fuel the rate of heating can be controlled with absolute certainty, and overheating with automatic temperature control on burner equipment becomes easily avoidable.

In order to do justice to the industrial gas users, as well as to his gas company, the fuel engineer must convince his prospect that it is his duty to select the proper burner equipment for his needs and that his recommendations are final. There are no two ways of doing anything and both equally good—one surely must be the better one.

Calculating Gas Consumption

The gas consumption for a given heating operation is easy to calculate. It has been the gas engineer's experience, particularly that of men engaged in chemical industries, that the manufacturers are unwilling to disclose any of their so-called secrets, and for this reason it becomes at times extremely difficult to design the proper burner equipment. The writer has found it of advantage not to ask any questions pertaining to the nature of material, to be heated, but to give the prospective gas user the necessary formulas for the calculation of the theoretical B.t.u. requirements and then to make proper correction to suit that particular condition.

The application of heat in chemical industries is of a more or less special nature; therefore, selection of proper burner equipment must be made with great care, so that it will conform with the chemist's exact requirements.

The Importance of the Appliance

"While gas is the force that does the work, the burner is the tool that directs it." We all know, and agree, that, without proper tools, good work cannot be done. In order to get the most out of the heat energy that gas contains, we must have a burner that will set all the energy stored in gas to work, and that burner must be so located that the heat will be directed to where needed.

The Radiant Fire

Perhaps the most useful direct heating burner equipment and the one best adapted to the chemists' use, is the radiant fire, or the so-called refractory bed. This consists of a quantity of special re-

fractory in shape of small, irregular pieces, spread approximately three inches thick in a well-insulated cavity built of fire brick, located about four inches to one foot under the vessel which is to be heated. This refractory is heated by impact type burners which direct a stream of combustible mixture of gas and air in theoretical proportions into the refractory where it burns, causing the pebbles to glow, giving off radiant heat, without any visible flame.

The best feature of this method of heating is that the flame does not come in contact with the vessel. This not only prevents local overheating of the material, but also insures uniform heat distribution, as radiant heat penetrates well without scorching. The glowing mass of refractory material is not subject to any appreciable changes in temperature, due to outside influence such as would affect bare flame, and it can be maintained at any degree of heat ranging from a gentle glow to white incandescence for indefinite periods. The refractory bed may be arranged to conform with the shape of any special type of kettle and may be set up in sections so as to protect bottom outlets, etc.

This type of burner equipment is very useful for heating of iron, copper and enamel-lined kettles, autoclaves, atmospheric and vacuum stills, crystalizers and evaporating pans. Among the operations for which it was installed by the writer may be mentioned sulphonations, caustic fusions, condensations, methylations, and both atmospheric and vacuum distillations. Its use in the paint and varnish industry for heating oils and gums is well established, and gas is fast replacing other fuels and steam for most chemical operations requiring careful temperature distribution and control.

Other Useful Heating Methods

Of course, the radiant fire is not a cure for all troubles, as there are other just as efficient methods of heating with gas. For example, there is the immersion type burner, which is designed for economical tank heating. While the radiant fire gives the chemist a reliable means of applying heat to the outside of kettles, replacing the time-honored steam jacket, so does the immersion type burner and heating coil afford an excellent means for internal heating, doing away with the steam coil. This equipment consists of a simple nozzle type burner directing a pointed flame through the wall of a kettle or tub into a coil submerged in the material to be heated, with the end of coil rising to a convenient height above the top part of the vessel as a flue.

This equipment affords a most efficient method of heating large volumes of liquids, thermal efficiencies of 80 per cent or so being easily obtainable. Its use is not limited to metal tanks only, but is just as safe in heating wooden tubs. It makes an ideal, economical unit for such operations as boiling, digesting, liming, heating of cleaning solutions, large precipitating tubs, and in other operations that do not demand live steam.

Generation of Steam

For generation of steam, where live steam is absolutely necessary, the gas-heated boiler affords the chemist a very efficient type of steam generator. It is entirely automatic in operation and when no steam is required the gas is throttled down to a point to maintain desired pressure. Due to the high degree of insulation of the boiler setting, the standby gas consumption is almost negligible.

The Drying Operation

Next in importance to heating materials during the manufacturing process we have the drying of the finished products. One of the best ways to dry any product is to pass through it large volumes of clean, hot air, at the highest possible temperature that the product will stand without suffering injury. Here, again, the recuperative type of indirect heated gas ovens and gas-fired air heaters are the best types of drying equipment to recommend for chemical use. Either of these units will furnish clean, preheated air, free from products of combustion, at the desired temperature. In gas-heated ovens there is the advantage of generating heat right at the point of its application. There are no costs to consider, due to upkeep of boilers and steam lines. Neither are there any transmission losses to contend with. The heat is put to work as soon as generated.

Controlling Devices Necessary

It is always a good policy to recommend temperature controlling devices with heating equipment. A good regulator soon pays for itself, not only in gas saving, and it also does away with constant watching of thermometers and leaves the operator free to look after his production.

Another point to consider in the installation of heating equipment is the proper insullation of burner settings and of the heated equipment. No matter how efficient the burners may be, if the heat is allowed to be dissipated by radiation from exposed surfaces, the installation cannot be economical and will not give the best results. Gas, like any other fuel, when used under a kettle should heat that kettle only and should not be expected to heat the plant as well.

Gas Losses

Their classification, means of prevention and relation between station and consumer meter reading

A. Wenger

(There is no question but that the loss of gas is a problem with which every gas company is directly concerned and to which it is giving its attention all the time. Gas loss in the mains and other apparatus around the plant is a matter which must always remain more or less of a problem, one that is interesting to all gas men. Hence the translation which follows, which was published in Das Gas und Wasserfach, 1925, pages 177-180, containing some information derived by a practical gas man from his actual experience in the gas works, is well worth reading by every technical man who is concerned with gas losses, the nature and source of these losses, their effect on the economy of the gas-making process and the means that have been adopted to reduce them to a minimum.—Trans.)

THE first consideration is the effect of the gas loss on the economy of the gas-making process. The profit that is obtained on the sale of gas is, of course, the difference between the selling price and the cost of the gas. If it is assumed that the loss of gas in the process of manufacture and distribution is 5 per cent, which is figured on the gas produced, then this simply means that for every hundred units (cubic meters or cubic feet) of gas made, there will be 95 cubic meters or cubic feet actually sold. Then, if it is assumed that the cost of 100 cubic meters of the gas is at the rate of 10 units of currency (in the original 10 pfenigs, but as the study is entirely comparative it is just as well to drop the currency denotation and use general terms instead.—Trans.) per cubic meter, and if the selling price of the gas is at the rate of 15 units of currency per cubic meter, then the profit that will be obtained from the sale of gas, figured with different gas losses, can be determined by a simple calculation, the results of which are shown in the following tabulation:

Gas Loss	Loss in selling	Cost of gas	Profit
5%	95x15	100x10	425 units
10%	90x15	100x10	350
20%	80x15	100x10	200
30%	70x15	100x10	50

A Graphical Study of the Problem

When the results obtained above are plotted in the form of curves, a very interesting insight is obtained into the relationship that exists between the profits obtained from the sale of gas and the loss of gas incurred in its manufacture and distribution. The prices of gas in units of currency per cubic meter produced are plotted as ordinates and the various losses of gas are shown as abscissae. The assumed selling price of the gas at 15 units and the assumed cost price at 10 units are also plotted as horizontal lines and two curves are drawn between these lines and the X axis. Thus, it will be seen from figure 1 that when the gas loss becomes equal to zero, the profit on the gas rises to five units of currency per cubic meter and that when the gas loss reaches 32.5 per cent, the profit becomes equal to zero. Between these two limits the profit curve assumes the form of a straight line, as may be concluded from the following analytical proof:

If the loss in selling per cubic meter of the produced gas is denoted by the symbol v, the cost of the gas by the symbol s, the profit on sale as g and the variable gas loss as x, then the following equation may be derived for every 100 cubic meters of gas produced:

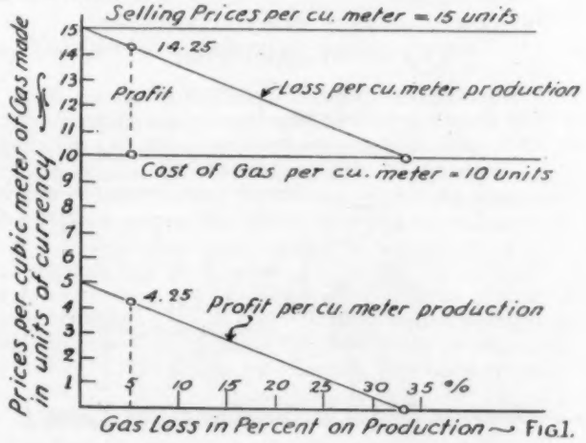


FIG. 1.

$$100\,g = (100 - x)\,.v - 100.s$$

From this equaton the following is obtained:

$$g = v - s - \frac{v \,.\, s}{100}$$, and with g equal to zero, the value of $$x = \frac{100\,(v - s)}{v}$$

This is the equation for a straight line with a slope of minus $\frac{v}{100}$, which cuts the ordinate axis at a distance v — s, as, when x is equal to zero, g becomes equal to v — s.

Conclusions Derived

From what has been said above, the following conclusions may be derived: In the first place, the smaller the difference between the cost of the gas

(Continued on page 535)

Helping the Customer to Decide

An analysis of the causes of indecision and the remedy

Edgar L. Mills

THERE are always people who have a constitutional difficulty in reaching a decision of any kind. It doesn't matter whether they are buying something which represents an outlay of cents or hundreds of dollars. They hesitate and are unable to bring themselves to the point of making up their minds without a real struggle.

Amazing as it may seem, it has been estimated by one keen student of customer psychology that 80 per cent of all people have a real difficulty to overcome at this point of a business transaction.

The Reasons

Among the "ingrowing" reasons or objections for delaying decision, the following may be listed:

(1) Not entirely satisfied.
(2) Possibility of better value for the money.
(3) Failure to recollect exactly the wanted size or color.
(4) Indecision as to value.
(5) Natural dislike to taking responsibility of definite action.
(6) Natural tendency to postpone action.
(7) Recollection of former unsatisfactory purchases which arises at this point as a warning.

There may be other reasons why people do not purchase promptly, but these are the main ones to be considered and the skilful salesman must learn how to meet each obligation successfully.

First of all let us remember that the expense of selling is substantially increased by customer delay, hesitation and expectation of several expensive demonstrations, or the call for an undue amount of time or service on the part of the sales clerk.

Expense Caused by Non-Purchasing Visitor

If a prospect comes into an establishment, takes up more or less time and attention and does not buy, an expense has been suffered which is a decided brake upon the business, and there is no way of making it up unless that person comes back and buys later. Even then, the selling expense may more than offset the net profit.

So it stands to reason that the more skilful the salesman the surer he or she will be to do a satisfactory volume of business, the smaller will be the expense of selling to the concern and the greater will be the worth of the employer to his employees.

Practical Ways of Overcoming Indecision

All of which brings us to some of the practical ways in which we can overcome the reasons for indecision on the part of the prospect. This, in turn, will increase the volume of sales and the longer the salesman practises overcoming these objections, expressed or not, the higher will be his rating in salesmanship efficiency.

Satisfaction

We can nearly always tell, without any manner of doubt, whether the customer is entirely satisfied or not by the expression on that individual's face, by his words or by the general attitude of interest or indifference.

If the customer is satisfied he will show it, but may make some objection as to the price, or may appear to hesitate deliberately with the idea that a lower price will be made or some other inducement offered. One man freely admits that he uses this method, often pointing out an imaginary flaw or finally asking if this or that will not be thrown in or a little extra of some kind included.

It is both amazing and amusing how many times the salesman must make up the mind of the customer and throw some straw in the scale pan on the right side.

The Customer Who Is Not Satisfied

If the customer is not entirely satisfied, you will read that fact readily, and now the point is to discover where the dissatisfaction rests. If the prospect intimates he can get better value for the money it is a mistake to argue, for anyone is perfectly justified in getting the best value possible, but point out the qualities of superior excellence of the article under consideration, the value in relation to the price asked, and the fact that the goods are being bought of a reliable concern and can be exchanged, if found unsatisfactory. Very often it is this reassurance that is needed.

Sometimes the customer is honestly in doubt whether this is just what he wants or not. Find out what he wants and, if you can fill that need, proceed to show him that your goods are right and he does not need to look farther. If it is obvious that you cannot fill his need satisfactorily offer to get the goods, state the time they will be on hand, or tell him where you believe such supplies can be found. You may lose the sale of this particular item, but confidence and good will will be established and the customer-prospect will have a friendly feeling and will appreciate your effort, especially if followed up by the suggestion.

Holding the Article for the Customer

"I'll hold this for you until you think it over. Suppose you let me know by such and such a time, as that may save you the trouble of coming back."

(Continued on page 530)

GAS MERCHANDISING

Domestic – Industrial

Ideas for the Man Who Sells

William H. Matlack

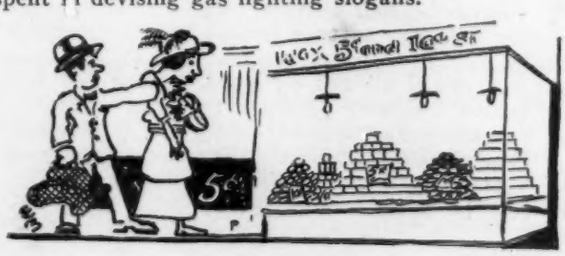
READY MONEY

SALES that are put into effect on pay day, which may be Saturday for artisans, the 1st or 15th of the month for clerks, shop and salaried people, are the most effective. The reasons for this is

that, notwithstanding the temptation to trade offered by the charge account, ready money in the real silk or jeans is more productive, a greater sales stimulator and has more purchasing power than the pass book.

PROGRESS

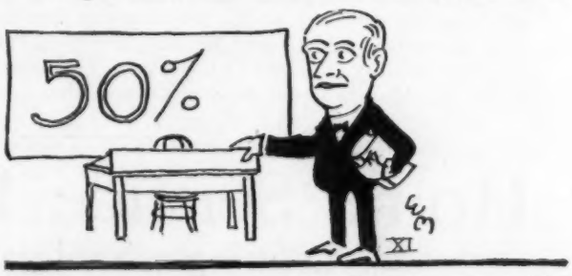
WE only have to turn back to the year 1917 to hear the harping of gas men on gas for illumination. We know of a gas man who would not permit his family to buy from merchants who used the bottled light in preference to the light that rivaled the sun. That was in the day when gas advertising consisted of a cut of a gas range and the text "cook with gas." Only eight years ago the major part of the gas man's conscious life was spent in devising gas lighting slogans.



Since "seventeen," however, we have made much progress—1925 finds gas the ideal fuel for over 1,000 purposes! Yet we must not be satisfied. We must not rest here. We must dream of new worlds to conquer, of a top burner control for ranges, of more efficient burners, burners that will utilize every B.t.u., dissipating none into the ether. For the more efficient we make our appliances, the more effective will become gas service and the more uses there will be for it.

INTERNAL INTEREST

IT seems to us that if interest is instilled in every gas company employee, the 50 per cent increase in gas sales can be attained in less than the

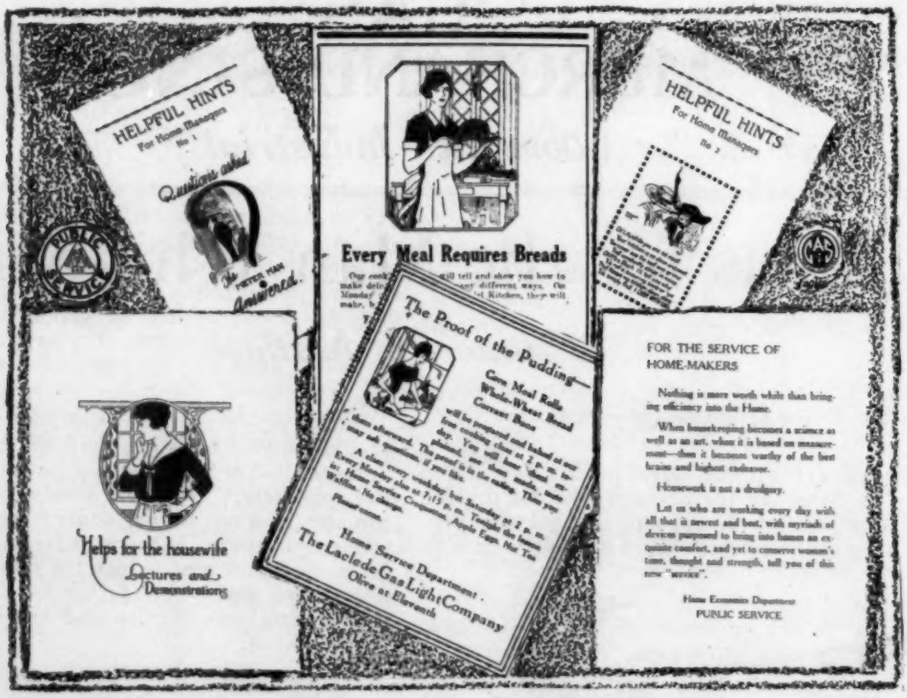


twelve months. Set a bogie! Give them something to shoot at and some reason for shooting and the rank and file will come through.

HOW DO YOU ADVERTISE TO HOME MANAGERS?

EXAMPLES of advertising have been selected from Bluefield, W. Va., St. Louis, Mo., and the Public Service of New Jersey, such as are used by the Home Service or Home Economics departments.

All of these advertisements, newspaper and direct mail, appeal directly to the home manager and, as will be noted, all are designed to "help" her better to understand gas service, offering in each case, though we were not able to show it in our "paste-up," recipes for good things to eat, all of which have to be cooked over a gas flame.


HELPFUL HINTS
For Home Managers
No. 1
Questions asked
Answered
Every Meal Requires Breads
The Proof of the Pudding
Corn Meal Rolls
Whole-Wheat Bread
Currant Buns
The Laclede Gas Light Company
Olive at Eleventh
HELPFUL HINTS
For Home Managers
No. 2
Helps for the housewife
Lectures and Demonstrations
FOR THE SERVICE OF
HOME-MAKERS
Nothing is more worth while than bringing efficiency into the Home.
When housekeeping becomes a science as well as an art, when it is based on measurement—then it becomes worthy of the best brains and highest endeavor.
Housework is not a drudgery.
Let us who are working every day with all that is newest and best, with myriads of devices purposed to bring into homes an exquisite comfort, and yet to conserve women's time, thought and strength, tell you of this new "service".
Home Economics Department
PUBLIC SERVICE

The lower right and left-hand illustrations are from a four-page folder used by Ada Bessie Swan, of the Public Service Gas Company of New Jersey; the two center illustrations are advertisements from the St. Louis daily newspapers and the two, right and left-hand illustrations at the top, are the first pages of a four-page folder used by the Bluefield Gas & Power Company of Bluefield, W. Va. The Bluefield folder contains hints as to service and also several recipes, as does the one used by the New Jersey company.

Advertising of this type should materially increase the use of gas by present customers and go a long ways toward promoting its use by "home managers to be" who may be included on the company's mailing list or who become interested in "The Proof of the Pudding" by reading the newspaper advertisements.

Home Service In Canadian Gas Co.

Cooking school gains immediate popularity

B. Faraday

Commercial Manager, New Brunswick Power Co.

THE New Brunswick Power Company, St. John, New Brunswick, has inaugurated a Home Service department. The purpose of this division is, as the name implies, the provision of a service carried directly into the home to assist users of gas in the solution of problems which develop from time to time. The department is in charge of Miss Grace Jo. Mason, of Trinidad, Colo., who has organized this branch of the service, and will continue to operate it until she has trained an assistant to carry on the work permanently.

In conjunction with the Home Service work, cooking classes have been instituted. Classes are held Tuesday and Thursday of each week at 2:30 p. m., each session lasting about two and a half hours. A series of new recipes are given at each class and the actual preparation and cooking of the ingredients is demonstrated. New ways of saving time in the kitchen, proper operation of the gas range, correct temperatures, methods of saving gas, and many other household topics, make these classes very interesting and instructive. More and more housewives are joining the classes, the lecture room being filled to capacity at each session. Over 1,000 attended the four opening classes, it being necessary the first day to turn hundreds away through lack of room.

A model all gas equipped kitchen has been installed, including a cabinet type gas range with automatic oven regulator and a box type stove with hand regulated oven; also 30-gallon kitchen tank and a gas water heater with timing device, kitchen cabinet, table, sink, etc.

(Continued on page 532)

INDUSTRIAL GAS LESSONS

IF IT'S DONE WITH HEAT — YOU CAN DO IT BETTER WITH GAS

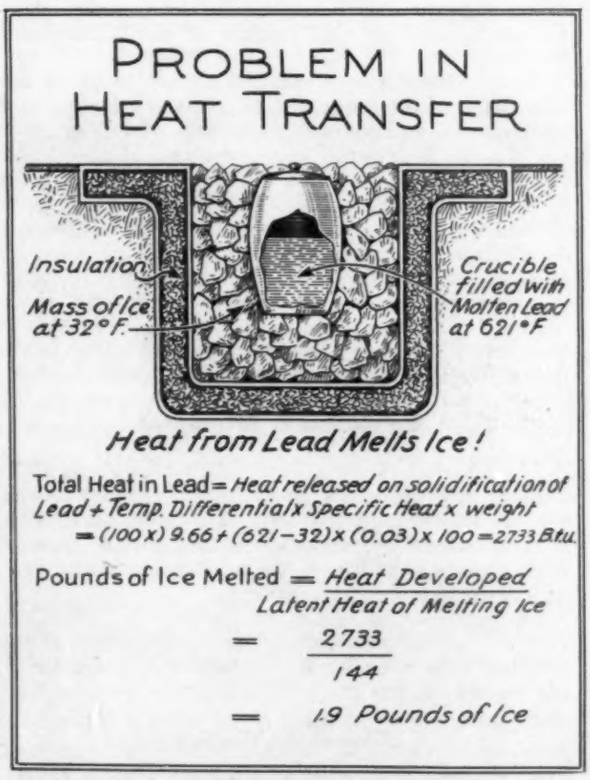
Lesson No. 75

Heat and Change of State

Further Examples of Calculation

Another example is useful. One hundred pounds of lead are solidified and the heat that is developed or rather released by the solidification is used to melt ice. The problem is to find the number of pounds of ice that will be melted by the heat that is released by the lead.

The latent heat of fusion of lead is 9.66 B.t.u. per pound and the melting temperature of the metal is


PROBLEM IN HEAT TRANSFER
Insulation
Mass of Ice at 32° F.
Crucible filled with Molten Lead at 621° F
Heat from Lead Melts Ice!
Total Heat in Lead = Heat released on solidification of Lead + Temp. Differential x Specific Heat x weight
= (100 x) 9.66 + (621 − 32) x (0.03) x 100 = 2733 B.t.u.
Pounds of Ice Melted = Heat Developed / Latent Heat of Melting Ice
= 2733 / 144
= 19 Pounds of Ice

621 degrees F. The melting point of ice is 32 degrees F. and the latent heat of fusion of water is 144 B.t.u. per pound. The first step is to find out what heat is available in the lead.

First there is the latent heat of fusion, which is equal to 100 × 9.66, or 966 B.t.u. Then, after the lead has become solid, the temperature of the metal can be reduced to 32 degrees F. and the heat that is liberated while this reduction is taking place will all be available for melting the ice. For it will be remembered that the melting or fusion of a solid takes place at a constant temperature, which is the melting point. The ice will melt at a temperature of 32 degrees F. and the temperature will not rise until all of the ice is converted from the solid to the liquid condition. On the other hand, it is not possible to melt ice under ordinary conditions unless the temperature reaches 32 degrees F. Below that point the ice cannot melt. Hence the point of equilibrium in the above problem is that point where the temperature of the hot body, the lead, and that of the cold body, the ice, reach 32 degrees F.

Heat Released

Thus the heat released in cooling down of the solidified lead is equal to the weight of the lead multiplied by its specific heat and by the temperature differential. The latter is 621, less 32, or 589. The specific heat of lead is 0.03. Therefore, the heat released will be

$$100 \times 0.03 \times 589, \text{ or } 1{,}767 \text{ B.t.u.}$$

The total amount of heat available for melting the ice will then be 1,767 plus 966, or 2,733 B.t.u. (966 is obtained by multiplying 9.66 % 100). To melt one pound ice at a temperature of 32 degrees F., there are required 144 B.t.u. Therefore, the number of pounds of ice melted by the 2,733 B.t.u. available from the lead is $\frac{2733}{144}$, or 19 pounds of ice.

Conclusion

These problems illustrate how the latent heat of fusion enters into practical calculations. In each case it is necessary first to establish the amount of heat that is available. If the heat is derived simply from cooling down a heated substance, then the quantity of heat is equal to the product of the specific heat, the temperature change and the weight. If the substance is converted from the liquid to the solid condition in addition thereto, there is an additional quantity of heat available which is equal to the product of the weight of the substance and the latent heat of fusion. It is also necessary to estab-

lish the point at which equilibrium takes place, that is, the point where no further heat transfer can take place and still fulfill the conditions of the problem. This point will, of course, depend solely on the conditions that are established in the problem. When the heat available is known, it is a simple matter to equate this to the heat required to produce a certain effect, either to raise the temperature of another substance a certain number of degrees or to convert it from the solid to the liquid state. Once the equation is established, it is a simple matter to solve for the unknown quantity, whatever it may be.

Summer Sales Conferences Well Attended

A program for future commercial activities developed at Gloucester

THE two Summer Sales Conferences held by the Commercial Section of the American Gas Association at Lake Mohonk, N. Y., and Gloucester, Mass., proved even more successful than the initial meeting of this kind held last year at Millbrook, N. Y.

Over 175 commercial men attended the meeting at Lake Mohonk for the four days of May 26 to 29, inclusive. It was also remarked that a number of the higher executives of gas companies attended the sessions and also took an active part in the meetings. This in itself showed the growing interest which gas company executives are taking in the sales side of their business.

On the opening day at Mohonk, Mr. T. R. Beal, president of the Central Hudson System, in whose territory the meeting was held, welcomed the visiting delegates cordially and told interesting facts about the Central Hudson region. Following this, Major Alexander Forward, secretary-manager of the American Gas Association, discussed the progress of the A. G. A. Testing Laboratory and its particular significance to merchandising and commercial men of the industry.

As a background for the discussion of particular sales problems in the gas business, Professor George Burton Hotchkiss, chairman of the Department of Marketing, New York University, gave an able address on "What the Gas Industry Can Learn from Other Businesses." This was followed by a discussion of the three-year sales program of the American Gas Association and an exposition of surveys of industrial development in gas company territories by Mr. Robert J. Canniff, chairman of the Sales Stimulation Committee of the American Gas Association.

Constructive Salesmanship

On the second day the meeting was inspired by a lively address by Arthur F. Sheldon, the founder of the Sheldon Schools, on "The Soul of Constructive Salesmanship." The other topics that day dealt with successful sales organization, the value and methods of home service, national co-operation in selling and reaching the housewife as a buyer. These were discussed by Philip Cabot, of the Harvard School of Business Administration; Miss Ina B. Rowe, of the Central Hudson System; Miss Ada Bessie Swann, chairman of the Home Service Committee of the A. G. A.; F. M. Feiker, Society for Electrical Development, and Dr. R. E. Rindfusz, secretary of the Periodical Publishers Association.

On the third day the more specific methods of building sales were taken up by talks on advertising, market research and direct selling. These were ably handled by John Lee Mahin, of the Federal Advertising Agency; T. O. Grisell, of the George Batten Company, and several leaders of the Commercial Section.

The fourth day was marked especially by an able discussion of the economics of gas sales dealing with the financial and operating relations of selling, given by Mr. P. S. Young, vice-president of the Public Service Electric and Gas Company of New Jersey. This was followed by lively addresses on the value of radio as a gas sales instrument by George F. McClelland, of Station WEAF; Relations with Architects, by D. K. Boyd; Co-operative Advertising for Associations, by Arthur M. East, manager of the "Save the Surface Campaign," and a discussion of the relations between hardware dealers and gas companies, by Ilew Soule, editor of Hardware Age.

Recreation in Afternoons

The afternoons were devoted to recreation and a number of golf, tennis, bowling and croquet tournaments were conducted with suitable prizes. The evenings were largely devoted to group discussions with leaders to talk over the application of the day's papers to specific gas problems.

Resolutions endorsing the program of the Commercial Section and calling for a repetition of this meeting next year were unanimously passed before the guests departed.

Gloucester Meeting

The Gloucester meeting, which was intended to cover only the New England region, had an equally successful program along similar lines, although the territory from which the attendance was drawn was more limited, and this was the first meeting in that district. The attendance was good and the

(Continued on page 532)

As The Journal Views It

MERCHANDISING GAS

The gas business is composed of a number of phases, some of which are found in all industries and others which are characteristic only of itself and the other utilities. Each part of this business structure possesses its own significance and all are intimately interconnected, forming a complex body which is the gas utility itself. It sometimes happens that a particular phase of the gas organization fails to receive the attention that it deserves. This may be due at times to incorrect conceptions of the functions of our industry, of the position that it occupies in the industrial world and of its relations with other business enterprises. It may also be due to the stress that may be laid at times on particular phases with seeming neglect of others.

It may sometimes escape us who are so closely in touch with gas matters, those of us who are intimately connected with routine matters pertaining to one branch or another of the organization in which we are working, that other parts of the business may possess as great, or even greater, importance than the one in which we are primarily interested. It may sometimes be that too close connection with the business makes us lose our perspective, so that we do not see it as clearly as others on the outside.

While we make a product that involves the application of fundamental physical and chemical principles, while our manufacturing processes are complicated and exacting, while we have many problems in the development of good will, in the establishment of a large body of customer-owners, while there are many other phases that may occupy our attention from day to day, none of us should ever forget that not only are we manufacturers but we are merchants as well. We have a commodity to sell and we have selling problems that are difficult to solve and keep solved. While we may have a monopoly in the domestic field to a greater or lesser extent, it does not mean that we can afford to neglect the selling end of our business and allow gas to sell itself.

It is true that at times we do not really sell gas, but the appliance in which it is used and consequently are apt to lose sight of the real value of our product. It may be that at times we do not make proper use of the advantageous properties of gaseous fuel that would help us to sell it and the appliance in which it is used. But it remains a fact that we have to sell both fuel and the appliance and it is practically impossible to divorce the two, nor is it altogether desirable.

Thus our selling efforts are generally directed toward the sale of gas appliances and thereby gaseous fuel. If our prospective customer is not sold for one reason or another, but leaves our sales rooms and offices with nothing to show for her visit to the gas company, we ourselves are also left with nothing to indicate that she had ever visited us. There are some gas companies who have realized that the merchandising end of their business is of extreme importance and that they must constantly sell their customers something so that when they leave the gas building they are in the possession of some article which serves as a distinct reminder that they have paid a visit to the gas company and obtained there something of value to them.

It appears to be an essential part of the gas business that the gas company try to sell its visitors something that will make them remember that it was worth while going to the gas building. It is, of course, most desirous that the sale be that of a gas-consuming appliance, but this is not always possible. And then, again, it might conceivably be undesirable if forceful sales efforts are used. But there are many little labor-saving devices that any housewife is very glad to have and that most are unacquainted with which the gas company can sell to them. It is not a question of making a profit on the small, cheap kitchen utensils, for at most the gross sales of these items could amount to but little. The important

consideration is that a feeling is thereby engendered in the visitor's mind that makes her want to return and repeat her visit to the gas company because she has been taught something and has acquired at small expense some device which will lessen her labors in the kitchen.

It is easy to see that by interesting the visitors to the gas company offices and sales rooms, by merely proving to them that their visits will be productive of benefit to themselves, during the course of such repeated visits a sale of a gas appliance will finally be made. Such sales will not be forced sales, but will come about naturally and will gain for the company a satisfied customer and an active agent in furthering that spirit of good will that now exists in most communities toward the gas utility.

HELPING THE CUSTOMER TO DECIDE

(Continued from page 524)

Many, many times we have seen the customer say, with evident relief, "All right, do that," and then, just before leaving the salesman, turn and say, "Well, you might as well give that to me, for I don't believe I can do any better. I think I'll take it."

When to Stop Urging

Here we must have a fine sense of distinction of how much to urge and when to stop urging.

The natural tendency to postpone action is inherited by many people who also cultivate the habit. Some such argument as, "These are selling quite rapidly and if you have found what you want you are fortunate, for it may not be here a little later," will often prompt decision; or the smiling reminder, "As long as you want this and have found what pleases you, you might as well purchase now and have the use and enjoyment of the article as to do without it, and then pay just as much a week or a month later." The logic of this is more than likely to strike home.

Deterrent Effect of Former Dissatisfaction

The recollection of former unsatisfactory purchases often serves as a warning, and the prospect wonders in his own mind, "Am I going to have a similar experience with this? Maybe I'll not be satisfied with it when I get it."

Here, again, the sales clerk may need to sell the institution and its service and its business policy before selling the article. Many a clerk will not take the trouble to do this, or does not know how to do it.

The sales value of it is unquestioned. If we are positive that anything that is not right will be made right, and that we run no risk in dealing with a certain firm, there will be no reason for delay. The risk in reality is theirs, not that of the buyer, and they must be certain that they can give satisfaction or they would not take the risk—at least that is the reasoning in the prospect's mind.

A "Just How" Method

It is one thing to read an article and to approve of its teachings in whole or in part, but what really counts is using the available methods regularly and systematically until we make them our very own. Try this plan:

Take a white card and note down the seven reasons listed why customers do not buy or why they find it difficult to decide. Keep this card right at hand and, as often as possible, classify the individual on the other side of the counter whom you have served. Then keep the good work up, applying the methods and reasonings you find most successful in giving the best results in each case.

Having done this for a period of one month, or three months, you will find your skill greatly developed, your sales increasing and your handling of the seven principles swiftly automatic. Practice makes for perfection and smoothness and sureness. Start here and now to perfect yourself in helping customers to decide who, for various reasons, find it difficult to do so on their own initiative.

THE BALLAD OF THE METER READER

Mr. J. Ritchie

Of The Wandsworth, Wimbledon and Epsom District Gas Company, from the "Wandgas Magazine."
We quote four of the nine verses:

Gude morrow, gude morrow, my first true love,
God mak' ye safe and free!
Hae ye come, hae ye come tae claim my hand?
For pity's sake, answer me!

And he has lookit her in the face.
And answer made he nane,
And he has opened a wee note book,
And has closed it up again.

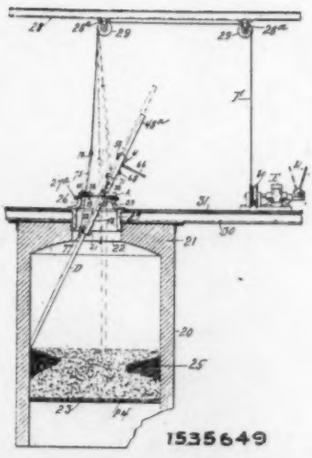
The lady has gone a deathly white.
Gude sakes! Gude sakes! cried she,
If ye're no the knight that I lo'ed lang syne,
Then what dae ye want wi' me?

Sweet lady, says he, as he bows fu' low,
—And it's seldom I met a sweeter—
I'm the man frae the Gas Light Companie
And I've come for tae read the meter!

PROGRESS IN GAS TECHNOLOGY
Domestic and Foreign

POWER DECLINKERING APPARATUS FOR GAS GENERATORS

THIS apparatus, which is patented in the United States Patent No. 1,535,649, consists of the combination of rotatable guide ring, to which there is pivoted an oscillating saddle and a declinkering bar, which is supported in bar guides, so that the former can be moved up and down and from side to side. Mechanical means are provided for moving the bar, as may be seen in the accompanying photograph.



GAS FROM HEAVY OILS

THE Hakol system generates gas from heavy oils by partial distillation. The oils used in this apparatus may vary considerably, but heavy bunker oils of 950 sp. gr. and upwards are the type of oil suitable for treatment for the purpose, these being referred to as not universally satisfactory for use in high compression engines. The plant in question has been designed as the result of a consideration of the reasons which have led to the non-success of similar plants in the past, and it is claimed that the difficulties of maintaining an output of gas of constant calorific value have been overcome.

The two essentials of such plants are (1) the maintenance of continuous and uniform temperature in the generator itself, and (2) the necessity for keeping the generator free from tar. The development of generators for producing gas from these heavy oils has, in the past, led to the use of baffles in order to assist combustion, while simultaneously externally heated generators were developed in order to insure a requisite decomposition temperature for the fuel. This temperature lies between 100 and 1,100 deg. C. Later a combustion of external heating and baffles was preferred, the external heating only being used while lighting the furnace.

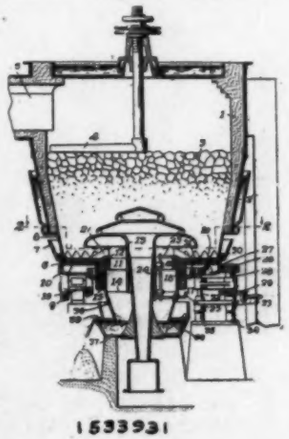
The final form of generator is capable of maintaining constant temperature, and coke does not form, and the further claim is made that by having a suitably shaped generator, coke and heat troubles can be avoided without resort to baffles and external heating. In this way the generator can be simplified to a great extent. It became obvious during the experiments that automatic control is needed to govern the relative proportions of oil and air, if regular results are to be obtained, and, further, that the preheating of the oil and air can be automatically accomplished by the generator, instead of being left to the discretion of the operator. The generator as now made relies upon the heat of partial combustion to provide sufficient heat to carry on the cracking process indefinitely. The greater the percentage of oil that is burned in the generator, the higher the internal temperature, but the calorific value of the gas is lower.

Efficiencies varying from 80 to 93 per cent have been obtained from tests made with different types of oil, it being found that an oil of 950 sp. gr. is easier to handle than a light oil of 850 sp. gr. On the other hand, the gases evolved from the heavier oil are dirtier than those obtained from the light oil on account of the increased temperature which breaks down the molecular weight of the gases more quickly and induces the formation of lamp black, which latter varies proportionately with the density of the oil, but is also influenced by the shape of the generator and the time of the stay of the gases within it. A heavy Mexican oil of 980 sp. gr. yields up to 10 per cent of carbon black. The gases obtained with the process vary from 155 to 190 B.t.u. per cubic foot. The sulphur content of the gas is low.—Chemical Age of London.

GAS PRODUCER

THE gas producer, which is the subject of United States Patent No. 1,533,931, is characterized as may be seen from the accompanying photograph, by a rotating ash support.

A rotating blast distributor is also provided in the apparatus. The apparatus works in such a manner that the rotation between the aforementioned parts results in the procuring of the movement of ashes within the apparatus so that the gas-making process is facilitated.



SUMMER SALES CONFERENCES WELL ATTENDED

(Continued from page 528)

same interest was displayed in the topics discussed.

Mr. Arthur E. Childs, president of the Massachusetts Lighting Companies, sounded the keynote of the convention in a rousing and fundamental discussion of the future commercial development of the gas industry taken from his broad viewpoint in every phase of gas company management. The other topics and speakers were as follows:

Address of welcome, Wm. Gould, commercial manager, Gas & Electric Improvement Company; response, Alexander Forward, secretary-manager, American Gas Association; "What We Can Learn from Other Industries," Edward F. Cullen, sales manager, Educator Cracker Company; "The A. G. A. Three-Year Sales Plan," R. J. Canniff, chairman Sales Stimulation Committee, A. G. A.; "Successful Sales Organization," Prof. T. H. Dillon, Harvard School of Business Administration; "National Co-optration for Sales," Norwood Weaver, vice-president, F. J. Ross Advertising Agency; "Changing the Habits in the Home," Dr. R. E. Rindfusz, executive secretary, Periodical Publishers Association; "Display Advertising, National and Local," P. F. O'Keefe, president, P. F. O'Keefe Advertising Agency; "Selling Direct to Consumers," Wm. G. Keay, branch manager, Eureka Vacuum Cleaner Company; "Sizing Up Your Market," Percival White, market counselor; "Building More Gas in Buildings," R. B. Mahn, architects' service department, Consolidated Gas Company of New York; "House Heating," J. L. Alexander, manager, Haverhill Gas Light Company; "Fifteen Minutes of Home Service," Ada Bessie Swann, chairman, Home Service Committee, A. G. A.; "The Radio, a Sales Builder," Walter L. Myers, commercial manager, Station WEEI.

Similar to the Mohonk meeting, the afternoons at Gloucester were devoted to recreation—to a certain extent—but so great was the interest in the proceedings of the mornings that many of the delegates spent the afternoons and evenings in group discussions in the hotel lounge and verandas.

A Program for the Commercial Section

Out of the two meetings brew certain fundamental thoughts crystallizing the ideas set forth by the speakers, and these are now being considered by the Commercial Section as a platform and program for future activities. Some of these viewpoints are:

1. The responsibility for the future expansion of the gas industry lies upon the commercial men. To shoulder this burden and accept his opportunity he should be given a greater weight of authority and consideration in the formulation of gas company development programs.

2. A comprehensive advertising and promotion campaign to sell the uses of gas to consumers in a national, powerful way, is not only inevitable, but needed soon.

3. The public needs and will welcome standards established and promoted which will mark appliances which give satisfaction. The seal of approval of the A. G. A. Testing Laboratory should be "sold" to the public.

4. Along with more and stronger publicity and advertising, the gas industry needs better sales organization, better salesmen and a bigger financial stimulation and resognition of results as achieved by the man who meets the public in sales efforts.

5. The making of better home-keepers, the restoration and increase of gas cookery, gas laundry and other domestic educational work as exemplified in Home Service is a vital need for gas companies. The radio—an open door to the ear of the home—is one of our most useful and potential instruments of Home Service.

6. House heating by gas is inevitable. We cannot stem its tide if we would. It must be sold, but, more important, we must hasten in our efforts to learn how to sell house heating.

HOME SERVICE IN A CANADIAN GAS CO.

(Continued from page 526)

It is anticipated that closer customer-company relations will result, due to this department's activities, also stimulation of the gas cooking in the home idea.

The Model Kitchen

As may be seen from the accompanying photographs, the attendance at the classes is very gratifying.

The Audience That Attended

Catechism of Central Station Gas Engineering in the United States

Installment No. 75

(Continued from last week)

Sieves

"Sieves. For ascertaining the fineness of cement, it will be convenient to use three sieves; viz., No. 50 (2,500 meshes to the square inch), wire to be of No. 35 Stubbs' wire gauge; No. 74 (5,476 meshes to the square inch), wire to be of No. 37 Stubbs' wire gauge; No. 100 (10,000 meshes to the square inch), wire to be No. 40 Stubbs' wire gauge. The object is to determine by weight the percentage of each sample that is rejected by these sieves, with a view not only of furnishing the means of comparison between tests made of different cements by different observers, but indicating to the manufacturer the capacity of his cement for improvement in a direction always and easily within his reach.

"For ascertaining the fineness of sand, two sieves are recommended; viz., No. 20 (400 meshes to the square inch), wire to be of No. 28 Stubbs' wire gauge; No. 30 (900 meshes to the square inch), wire to be of No. 31 Stubbs' wire gauge.

Tensile Strength

"Tensile Strength. The tests should be applied to the cements as offered for sale. The following table gives the average minimum and maximum tensile strength per square inch which some good cements have attained:

Age of Mortar when Tested. Clear Cement.	Average Tensile Strength in lbs. per sq. in. Portland. Min.	Max.
1 day—1 hour, or until set, in air, the remainder of the time in water....	100	140
1 deek—1 day in air, the remainder of the time in water.....	250	550
4 weeks—1 day in air, the remainder of the time in water.....	350	700
1 year—1 day in air, the remainder of the time in water.....	450	800
1 Part Cement to 3 Parts Sand by weight.		
1 week—1 day in air, the remainder of the time in water.....	80	125
4 weeks—1 day in air, the remainder of the time in water.....	100	200
1 year—1 day in air, the remainder of the time in water.....	200	350

"If satisfactory results are obtained with a full dose of sand, the trials need go no further. If not, the coarser particles should be excluded by using a No. 100 sieve in order to determine approximately the grade the cement would take if ground fine, for fineness is always attainable, while inherent merit may not be.

Standard Sand

"Standard Sand. The question of a standard sand seems one of great importance, for it has been found that sands looking alike and sifted through the same sieves give results varying within rather wide limits.

"The material that seems likely to give the best results is the crushed quartz used in the manufacture of sandpaper. It is a commercial product, made in large quantities and of standard grades, and can be furnished of a fairly uniform quality. It is clean and sharp, and although the present price is somewhat excessive (three cents per pound), it is believed that it can be furnished in quantity for about $5 per barrel of 300 pounds. As it would be used for tests only, for purposes of comparison with the local sands and with tests of different cements, not much of it would be required. The price of the German standard sand is about $1.25 per 112 lb., but the article, being washed river sand, is probably inferior to crushed quartz. Crushed granite could be furnished at a somewhat less rate than quartz, and crushed trap for about the same as granite; but no satisfactory estimate has been obtained for either of these.

"The use of crushed quartz is recommended by your committee, the degree of fineness to be such that it will pass a No. 20 sieve and be caught on a No. 30 sieve." (Baker, Masonry Construction.)

Unless a testing machine is available it is not always possible to make the tests for strength, and in the ordinary work for which Portland cement is employed in gas works these tests are not really necessary if a good brand of cement is purchased. The tests for fineness and soundness are, however, very easily made, and the latter should always be made on any cement that is to be used, especially in foundation work.

Rosendale or Utica Cement

356. What is Rosendale or Utica cement, how is it made, and what tests should be applied to any given sample to determine its quality?

An. Rosendale or Utica cement, also called natural cement, is made from limestones composed of carbonate of lime, carbonate of magnesia and clay. The limestone is burned in a kiln and then ground to a fine powder. "Any magnesian lime-

stone containing as high as 60 per cent of carbonate of magnesia may be presumed to be capable of yielding hydraulic cement of greater or less value, if properly burned, no matter whether clay be present or not."

Cement should be tested for fineness, liability to cracking and tensile strength.

"Fineness: 90 to 95 per cent of the cement should pass through a sieve of 2,500 meshes per square inch. Other qualities being equal, the finer a cement is ground the greater is its value.

Test for Checking or Cracking

"Checking or Cracking. The test for checking or cracking is an important one, and, though simple, should never be omitted. It is as follows:

"Make two cakes of neat cement 2 or 3 inches in diameter, about ½ inch thick, with thin edges. Note the time in minutes that these cakes, when mixed with water to the consistency of a stiff, plastic mortar, take to set hard enough to stand the wire test recommended by General Gillmore, 1-12 inch diameter wire loaded with one-fourth of a pound, and 1-24 inch loaded with 1 pound. One of these cakes, when hard enough, should be put in water and examined from day to day to see if it becomes contorted or if cracks show themselves at the edges, such contortions or cracks indicating that the cement is unfit for use at that time. In some cases the tendency to crack, if caused by the presence of too much unslaked lime, will disappear with age. The remaining cake should be kept in the air and its color observed, which, for a good cement, should be uniform throughout (yellowish blotches indicating a poor quality), the natural cements being light or dark according to the character of the rock of which they are made. The color of the cements when left in the air indicates the quality much better than when they are put in water.

Tensile Strength

"Tensile Strength. The tests should be applied to the cement as offered for sale. The following table gives the average minimum and maximum tensile strength per square inch which some good cements have attained:

Age of Mortar when Tested.	Average Tensile Strength in lbs. per sq. in. Rosendale.	
Clear Cement.	Min.	Max.
1 day—1 hour, or until set, in air, the remainder of time in water.....	40	80
1 week—1 day in air, the remainder of time in water.....	60	100
4 weeks—1 day in air, the remainder of time in water.....	100	150
1 year—1 day in air, the remainder of time in water	300	400
One Part Cement and One Part Sand by Weight		
1 week—1 day in air, the remainder of the time in water.....	30	50
4 weeks—1 day in air, the remainder of the time in water.....	50	80
1 year—1 day in air, the remainder of the time in water.....	200	300

"If satisfactory results are obtained with a full dose of sand, the trials need go no further. If not, the coarser particles should be excluded by using a No. 100 sieve, in order to determine approximately the grade the cement would take if ground fine, for fineness is always attainable, while inherent merit may not be.

Weight

"Weight. For any particular cement the weight varies with the degree of heat in burning, the degree of fineness in grinding, and the density of packing. Other things being the same, the harder-burned varieties are the heavier. The finer a cement is ground the more bulky it becomes, and consequently the less it weighs. Hence, light weight may be caused by laudable fine grinding or by objectionable underburning.

"The weight per unit of volume is usually determined by sifting the cement into a measure as lightly as possible, and striking the top level with a straight edge. In careful work the height of fall is specified. The weight per cubic foot is neither exactly constant nor can it be determined precisely, and for the practical purpose of the user is of very little service in determining the value of a cement. However, it is often specified as one of the requirements to be fulfilled.

"The weight of Rosendale cement, determined by sifting the cement with a fall of three feet into a box having a capacity of one-tenth of a cubic foot, is 49 to 56 lb. per cubic foot. The difference in weight for any particular kind is mainly due to a difference in fineness.

"Ulster Co. Rosendale cement weighs 300 lb. per barrel net; Akron, Milwaukee, Utica and Louisville Rosendales weigh 265 lb. per barrel net." (Baker, Masonry Construction.)

Preparation and Use of Cement Mortar

357. Describe the preparation and use of cement mortar for brick work, with the precautions to be observed to secure uniformity and strength.

Ans. A paste of good hydraulic cement hardens simultaneously and uniformly throughout the mass, and its strength is impaired by any addition of sand. The relative quantities of sand and cement depend somewhat upon the kind of work and upon the conditions of the ingredients when measured. For ordinary use it is customary to add as much sand as is possible without making the mortar porous. The proportions may vary from one part of cement and two parts of sand to one part of the former and four of the latter.

(Seventy-sixth Installment Next Week)

GAS LOSSES

(Continued from page 523)

and its selling price, the sooner will the gas loss absorb the profit. Thus, in the case of a small plant, where the difference between cost price and selling price of the gas is probably less than that at a large plant, it is necessary to exert greater care in watching the gas losses and reducing them to as low a point as possible. On the other hand, the greater the difference between the cost and selling price of the gas, the less is the effect of the gas loss in absorbing the profit. The low gas rates which exist in many countries today make it absolutely necessary to keep the losses of gas down to a minimum in order to make a profit on the business.

Sources of Gas Losses

It has been shown that the losses of gas play a very important role in the economy of the gas works and it now remains to be indicated just what are the sources of these losses. It is understandable that it is first necessary to know what these are in order to be able to lay down any methods for reducing the losses or doing away with them altogether.

Up to the present time it has generally been customary to regard the gas losses as of two origins or kinds, one the apparent losses and two the actual losses.

The following may be considered under the heading of apparent losses. In the first place there are the losses that are due to the change in the condition of status of the gas, which is brought about by an alteration in the temperature, the pressure, the water content and the proportion of condensable ingredients contained in it.

The gas that is produced in the works is measured in the station meter at a pressure of 150 to 300 millimeters. This pressure varies in accordance with the holder pressure. On the other hand, the gas is generally measured in the house meters at a pressure of 50 millimeters. There is, therefore, a pressure difference of 100 to 250 millimeters of water and an increase in volume of 1 per cent for every hundred millimeters pressure difference, measured approximately on the water column.

Effect of Temperature

As far as the effect of temperature is concerned, it may be stated that for every 10 degrees difference in temperature (degrees Centigrade) between the station meter and the house meter, there will be a reduction in volume amounting to 3.7 per cent of the measured gas volume. In general, the temperature at which the gas is measured is about 18 degrees C. and it is distributed at about 10 degrees C., so that the reduction in volume amounts to about 3 per cent.

The effect of the water vapor in the gas is evidenced in a reduction of the gaseous volume amounting to about 1 per cent for every degree Centigrade for the temperature range of 25 to 5 degrees C. The effect of the condensation of volatile hydrocarbons which are present in the gas on its volume can be determined by means of a simple calculation with the aid of the vapor tension tables. This also reduces the volume of the gas.

If, then, the net effect of these factors on the reduction of the volume of the gas is calculated, it will be seen that in the summer months there will be a reduction in gaseous volume equivalent to about 4 per cent, and in the winter months this will be in the neighborhood of 3 per cent. It is, of course, possible that the net loss of volume may be even greater in any one month.

Measuring Errors

Measuring errors are produced by inaccurate measurements in the station and the house meters. Inaccurate measurement of gas used in street lighting will also give rise to losses. The accuracy of meters has, however, been established beyond question and, as a general rule, very little gas is lost in this manner. It is claimed that an accuracy of plus or minus 2 per cent is adequate in the gas meter and one of plus or minus 4 per cent in the determination of total consumption of gas.

Direct or Actual Losses

The gas that is lost by direct causes, or the actual gas loss, as it is called, is brought about by leakage through holders and pipes. A relative tightness may be expected of a holder and the amount of gas that escapes from it is only a small fraction of the entire volume that is stored and passed through the apparatus in the course of a year's time. As far as the piping system is concerned, it is generally held to be reasonable to expect a loss of gas amounting to from 100 to 200 liters per kilometer length of pipe per hour, or from 800 to 1,600 cubic meters of gas loss per kilometer per year.

Another group of gas losses is formed by those apparent losses which occur due to the variation in the time in which readings are made. Thus, for example, the readings of gas volume on the station meter are only few compared with the great many readings that are made of the customers' meters, and this may connote a considerable apparent loss. The deviations in the readings that are made on gaseous volumes may amount to as high as 10 per cent from one reading to the other, according to the time interval separating them, and then ,again, the average of yearly measurements may vary from year to year by as much as 1 per cent.

Hence, if all the errors that are made in measuring the volume of gas be taken into consideration, as they have been enumerated above, it will be evident that an average loss of from 5 to 8 per cent may be incurred on the total yearly production of gas.

Avoiding Gas Losses

A few words will be said regarding the method that may be employed for avoiding or reducing gas losses. Losses of gas due to change in condition

can be brought about only to a difference in temperature. The measuring operations should be carried out in such a manner that when the gas enters the station meter its temperature is approximately normal, that is, in the neighborhood of 15 degrees C. It is not possible to effect any change in the pressure conditions, as this is fixed by the existing equipment.

The tightness of the holders is determined by control measurement of the gaseous volume, with consideration of the change in volume caused by changes in temperature during the period that observations are being made. Hence, care should be taken to see that a water seal is used around both the entrance and exit pipes to the holders, as valves are not tight enough for this purpose.

Losses in Pipes and Meters

The distribution system may be examined for gas losses by pressure and measuring tests. The best way to examine the tightness of the distribution system is to make an investigation of the gaseous consumption some time after midnight, at which time a very small amount of gas is being used.

Errors in gas meters are due to leakage through the bellows and the drum. In the case of the dry meter they are sometimes due to a light load on the meter. The meters should, of course, be tested regularly, at best at the points at which they are installed in order to avoid any great consumption of time in the process.

Errors in the measurement of gaseous volume in the station meters can be determined in a number of ways which have become more or less standardized. It is suggested that one such method is to use two holders. In this case one of the holders is used as a meter and the gas is allowed to enter the distribution system from that holder, but in this connection it must be mentioned that care must be taken to see that the cut-off contrivances are absolutely tight, otherwise the tests are valueless. Accuracy of the station meters is not only important, as far as measurement of gas losses are concerned, but also for determining the exact production of the gas works, and it is for this reason that a regular testing of the accuracy of these meters is essential and should form a part of the regular routine of the gas works.

Irregularity of Time of Reading

The last cause of the apparent loss of gas is due to the fact that the time of reading meter does not conform to the great number of readings that are made on the customers' meters. The assumption on which conformity between the readings of gaseous volume on the station meter and on the house meters must be based is simultaneous reading of all meters at a definite time. However, as this is patently impossible, the reading of the house meters is carried out so that half are read before the reading of the station meter and the other half after the reading of the station meter, which takes place, as a rule, on the first of each month. This method is, however, based on another assumption that on the one day as on the other the consumption of gas as indicated by the house meters is the same, which is not always the case.

A curve sheet has been drawn, which is shown in figure 2, for the purpose of aiding the reader to see the relationship that exists between the various factors concerned in this matter. The time of readings are plotted one after the other as abscissae and the quantity of gaseous volume is shown on the ordinate scale. In order to simplify the problem, the assumption is made that we are concerned with a station meter, measuring the continuous consumption V and with two auxiliary meters, or house meters, each one measuring half the consumption, so that

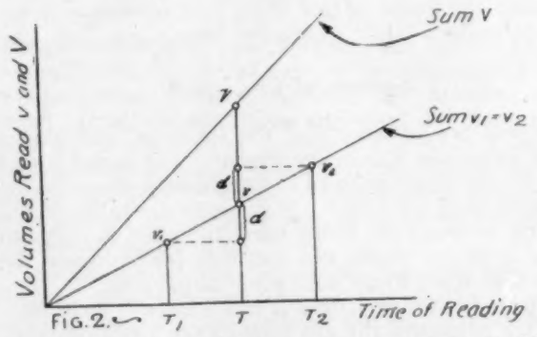


Fig. 2—Graphical Representation of Simple Problem

v_1 is equal to v_2. These two meters are located behind the principal meter.

Discussion of the Graph.

It is evident from the figure that the consumption of gas as measured by the principal meter, starting at zero, is proportional to the time T, so that at any definite time interval T, we have the equation $V = v_1 + v_2$. If, then, one of the auxiliary meters v_1 is read at the time T_1, and the other house meter at the time T_3, which is later than the time T_2 of the main meter, then the relation $V = v_1 + v_2$ is no longer tenable. The reason for this is that from the time T_1 at which the small meter was read up to the time of reading the large meter, T_2, a certain time period $T_2 - T_1$ has elapsed in which the consumption of gas, as indicated by the small meter, increased by the differential d up to the time T_2. At this time it indicated the quantity of gas, v. This difference, $v - v_1$, is consequently the error in the readings, and this will only be compensated for if the reading of the second house meter at the time T_3 has been reduced in the same degree that the reading on the first was premature. In other words, compensation will ensue when the following relation is true: $T - T_1 = T_1 - T_2$.

If, then, we assume that the sum v_1 represents one-half of the house meters and the sum v_2 the other half of the house meters of a gas works, then it is possible to employ the curves in figure 2 for explaining the relationship that exists between the station meter on the one hand and the house meters

on the other hand. From this it then becomes clear what significance is applied to the assumption that the readings of the house meters are made into two equal parts before and after the first of the month, with the additional assumption that the quantities of gas which are represented by these readings increase uniformly with the time, which naturally does not take place.

Irregularity of Meter Readings

From the foregoing it is therefore clear that the apparent loss of gas in the process of mensuration, which is brought about by errors in the readings, becomes greater, the more irregular the distribution of the meter readings, before and after the day on which the station meter is read. This fact is further exemplified in figure 3. The quantity of gas that is read off from the station meter on the day that the test is made is designated by the symbol V. On the other hand, the sum of the readings on the

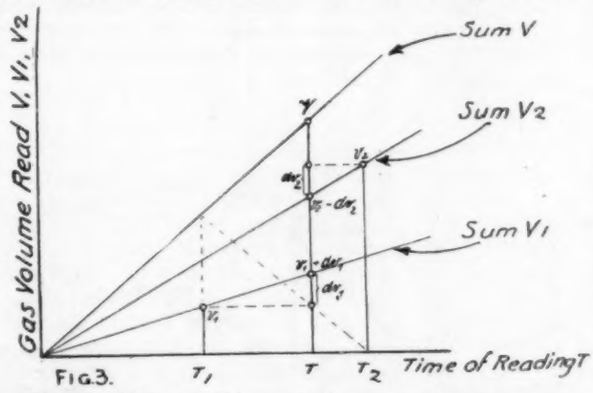


Fig. 3—Effect of Irregularity of Meter Reading

house meters, which are read before the station meter is read, is designated by v_1 and the sum of the readings on the house meters that are read after the station meter has been read is noted as v_2. Figure 3 then differs from figure 2 in this respect, namely, that the sum v_1 is no longer equal to the sum v_2. Of course, from a practical standpoint such equality between the two is likewise not possible.

On the other hand, the equation $v = v_1 + v_2$ remains. This means, in other words, that at any time T, the quantity of gas that is measured by the station meter, must agree with the quantities that are read off the house meters. But, due to the premature readings of the meters in group v_1 at the time T_1, as may be seen from the figure, there results a measuring error of $d.v_1$. If, however, this error is counterbalanced by a similar error due to the delayed readings of the house meters in the group v_2, then the time at which these readings are made, that is T_2, must be chosen in such a manner that the time differential $T - T_1$ must bear the same relation to the differential $T_2 - T$ as the inverse of the ratio between v_1 and v_2. In other words, dv_1 must equal dv_2. The time T_2 may be found by making suitable constructions in the figure 3 so that the perpendicular erected at the point T_1 is lengthened until it cuts the line V and another line is then drawn from this point of intersection through the lower limit of the line dv_1. The point at which this oblique line cuts the X axis will be the time T_2.

Application to Practical Conditions

Under practical operating conditions the difference between two readings which are made at the beginning and the end of the month gives an idea of the difference between the gas produced during a definite period of time, usually one month, and that quantity of gas that was actually delivered to the customers. In this connection the station meter is read on a given day, while the increase in the quantity of gas consumed is distributed through a period of time amounting to several days. The assumption is then made from this circumstance that at any time the gas measured on the consumers' meters is equal to the gas that is read off on the station meter, and when the readings are shifted from one time to another a series of errors arise.

Graphical Representation of Relationships

In order to visualize these relationships, figure 4 is given, in which the quantities of gas that are measured by the station meter are shown designated by V_1 and V_2, while the quantities of gas that are measured by the house meters are divided into two summations v_1 and v_{11}. In this case v_1 indicates the sum of the readings made on house meters, which readings anticipate the reading of the station meter, in other words, are made before the first of the month, and v_{11} is the sum of the readings on the house meters made after the first of the month, on which day the station meter is read. It is, furthermore, assumed that the gas consumption is regular, and the daily consumption of gas is designated by g. Then we have the equation $V = gT$ and again $v_1 = v_{11} = 0.5\ gT$. In other words, the V curves appear as straight lines.

The station meter is then read at the time T_2 and T_5, so that the consumption of gas during the time interval $T_5 - T_2$, which is approximately 30 days, is indicated by the expression $V_2 - V_1$. The time at which readings are made on the first half of the house meters, the sum of which readings is indicated as v_1, is designated by T_1. The time at which the readings of the second group of consumers' meters are made is designated as T_3. The time T_1 denotes the time at which the first meter of group v_1 is read and the time T_3 denotes the time at which the last meter in group v_{11} is read.

Time Relations Must Be Observed

If, then, an error is to be avoided in measuring the quantity of gas, it is necessary that the time differential $T_2 - T_1$ that exists between the beginning of the reading of the first group of meters and the time of reading the station meter must be equal to the time differential $T_3 - T_2$, which is the differential from the time of reading the station meter to the time of reading the last meter in the second

group of consumers' meters. After a month has elapsed the station meter is read again at the time T_5, while the reading of the house meters begins at the time T_4 and is ended at the time T_6. Again, for the second reading, the similar relation must hold good, namely, $T_5 - T_4 = T_6 - T_5$, if errors in mensuration are to be avoided.

Four Readings of Importance

From this study it is deducted that the correct determination of the monthly consumption of gas is dependent on four readings, which, when they are not taken at the proper times, give rise to a series of errors. Thus, if it is assumed that eight days are necessary for reading all of the house meters and that the start of the reading of the house meters was delayed in such a manner that readings were commenced two days before the first of the month, hence the readings must have lasted until six days after the first. Then, if the meter readings are to be referred to the reading which is made on the station meter, which takes place on a certain day which should lie exactly between the beginning and the end of the house meter reading, this would be in the foregoing case on the second day after the first of the month. The error in the readings then consists of the difference in time between the reading day of the station meter on the first of the month and that of the house meters on the second of the month, and hence in this case the error is simply two days' consumption, or 2g.

Large Monthly Error Ensues

Then, if next month the reading of the house meters is begun six days before the first of the month, for the same reason the error in the reading will amount to 2g, that is, twice the daily consumption of gas, and when the month is assumed to be 30 days long, the percentage error is found as follows: $\frac{4g \times 100}{30g}$ or 13.2 per cent. For this example it is evident that under very unfavorable circumstances a reading error as high as 13 per cent can ensue, which of course may be equalized in the following month, so that the yearly difference does not amount to more than 1.1 per cent.

Practical Conditions More Complex

In practical work the conditions are not so simple as has been painted. It does not happen that the reading of the house meter in one month is the same number of days before the first as in another month. Due to this condition, as can be seen from figure 4, it is not possible to choose the time of reading of the meter in such a fashion that reading errors are avoided.

Then, again, the following assumption is not true, namely, that the consumption of gas, as recorded by the meter, increases daily in a regular manner, and for this reason the lines V and v are not straight lines, but curves. The laws on which these curves are based are not known with the exception of that one that pertains to the station meter. This condition gives rise to another error in the reading of the meters, which error cannot be determined. Hence, it is evident that in the foregoing discussion the assumption that was made regarding the constant consumption of gas on every day was necessary in order to be able to draw some kind of a picture of the conditions that exist in this problem and that affect the results that are obtained by the reading of the station meter and the house meters, so that a correct estimate of the daily or monthly consumption of gas may be derived.

Conclusions

The following important conclusions can be drawn from this study and applied in practice to the reading of station and house meters.

1. The meters should be read at such a time that the readings are begun a certain number of days before the first of the month, or the reading of the station meter, whenever that may be, and then completed the same number of days after the first of the month.

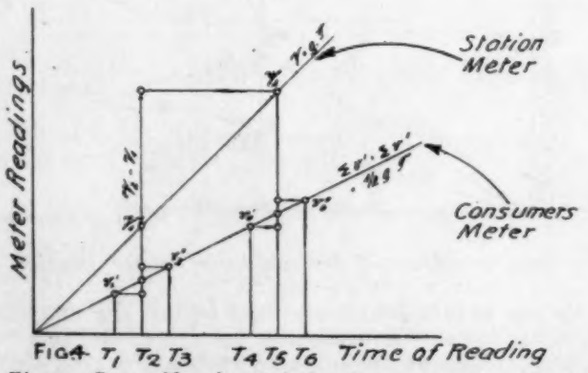
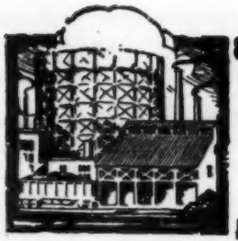


Fig. 4—Curve Showing Relation Between Factors Under Practical Conditions

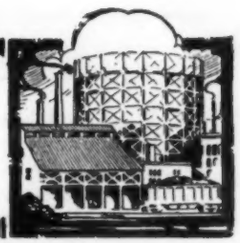
2. The two groups of meters which are read before and after the first of the month should give consumption figures which are as equal to each other as possible in toto and the meters should be read in the same order at all times.

3. As the assumption of a daily regular consumption on an individual meter does not hold good in actual practice, there will be introduced a certain error in the month's consumption figures, which error is unknown in quantity, but which, on the other hand, during a period of months becomes equalized and reduced in magnitude. Hence the monthly consumption of gas in any one month is a figure on which too great reliance must not be put, but the average of several months' readings should be accepted instead.

4. The error in the readings made over a period of one year cannot amount to more than 1 per cent even under very unfavorable conditions.



NEWS OF THE GAS INDUSTRY



Third Sectional Meeting, Pacific Coast Gas Association, Held in Oakland

The Pacific Coast Gas Association held its third sectional meeting of the year in Oakland, Cal., on June 5, 1925. While these meetings are designed to be of largely local interest, they always attract members from various parts of the Pacific Coast. The Oakland meeting was no exception as gas companies and appliance houses from Portland, Ore., to San Diego, Cal., were represented. The attendance was well over 250.

The meeting was a one-day affair, but every minute of the day was occupied. President E. L. Hall called the first session to order about 10 a. m., turning it over to R. S. Fuller, distribution engineer of the Pacific Gas and Electric Company, for a discussion of fittings. Several coast gas companies now have facilities for testing all fittings purchased, and the number found to be defective reaches alarming proportions. The meeting adjourned at noon to witness a demonstration of brazing cast iron pipe.

Home Service Manual

The afternoon session was devoted in part to a discussion of the home service manual presented in tentative form by C. R. Miller of Portland, chairman of the Home Service Bureau. The manual is designed to be a textbook on gas appliance installation and maintainance and will fill a long felt need among gas appliance dealers. The outline of the manual given by Mr. Miller was enthusiastically received and the committee was authorized to proceed with its work of gathering written suggestions from qualified sources.

Intimately connected with the manual was the work done by the Committee on Municipal Ordinances. President Hall briefly outlined the advantages that would accrue from having a fair and thorough series of regulations in regard to gas installations adopted uniformly by all Pacific Coast cities. Mr. Miller has also acted as chairman of the Ordinance Committee and some time was spent in the discussion of the tentative model ordinance submitted. This was endorsed and the committee will solicit written criticism as to details.

Appliances for House Heating

One provision in the ordinance created an exceptional amount of comment. Nowhere else in the country is gas house heating so highly developed as on the Pacific Coast, and the large demand for heaters, coupled with the oftentimes crude construction of homes permitted by the warm climate, has led to the marketing of a few gas appliances which are not deemed safe. A clause was therefore inserted in the ordinance prohibiting the marketing of appliances not certified by some recognized authority. While this clause met with unanimous approval, there was some difference of opinion as to the ways and means of making it most effective. This problem was left in the hands of President Hall, with the hope that some plan could be worked out which would be made immediately effective and which would meet with the approval of all elements of the association.

The day closed with an informal dinner and entertainment. One of the features of the dinner was the presentation of McCarter medals and certificates to W. A. Bahr, O. L. Dickinson and J. E. Fields. Certificates were presented to Ray Kutter, Pete Saeti, Daniel A. Kirkpatrick, Horace Oftedal and Alfred E. Englebright. All of these men are employees of the Pacific Gas and Electric Company and the presentation was made by Wigginton E. Creed, president of the company.

Officers Elected by Southern Gas Association

The following officers were elected by the Southern Gas Association for the coming year:

President, Sam E. Linton.

First vice-president, A. E. Merchant.

Second vice-president, Sam W. Brown.

Secretary-treasurer, J. P. Connolly.

Directors, F. H. Knapp, F. A. Matthes, R. J. Hole, W. J. Taylor.

The association will meet next year at New Orleans on May 15 to 17 inclusive.

G. B. Shawn Joins Testing Laboratory Staff

G. B. Shawn, who has been connected with the U. S. Bureau of Standards for the past five years, is the latest addition to the staff of the testing laboratory which has been established in Cleveland, Ohio, under the auspices of the American Gas Association. Mr. Shawn began his schooling at Johns Hopkins University in 1915, but left there in 1917 to enter the U. S. Army. After about a year and a half service in France, considerable time of which was at the front, he returned and graduated from George Washington University, Washington, D. C., with an A. B. degree in chemistry.

Mr. Shawn's work at the bureau has been confined principally to the improvement of natural gas burners and design of atmospheric gas burners in general. He also assisted in the City of Baltimore investigation. Recently he has been engaged in conducting various tests in conjunction with the research work now being undertaken by the Bureau of Standards for the American Gas Association. His employment as superintendent should be a valuable acquisition to

the A. G. A. laboratory staff and should increase further the feeling of confidence with which this organization is at present regarded.

Mr. R. M. Conner, director of the laboratory, reports that the work of equipping the laboratory is now actually proceeding. He states that the first important thing on the program will be the research work to be undertaken jointly with the U. S. Bureau of Standards.

Utah Gas & Coke Co. Expanding

The Utah Gas & Coke Company has adopted a progressive policy and construction activities of the company are being extended over Salt Lake City generally. The program for the current year calls for the expenditure of $200,000, to be used in the laying of new mains and providing meters and service in all parts of the city. This expenditure, caused by expanding business, is 600 per cent heavier than for 1924. Besides employing from 350 to 400 extra men on construction work, the company has divided the city into twelve districts, which have been allotted among twenty-five salesmen who are engaged in a house-to-house canvass in the selling of service and appliances. According to George R. Horning, vice-president and general manager of the company, business shows an increase of 1,000 per cent as compared with the same period of last year, due mainly to the policy of expansion.

Mr. Horning, for six years general manager of the company, was recently named by the board of directors as vice-president of the company and O. C. Olpin was named assistant secretary. This is the first time that Salt Lake officials have been officers of the company. Officers named by the directors are: Martin J. Insull, Chicago, president; W. C. Sharp, Chicago, vice-president; George R. Horning, Salt Lake City, vice-president; Oliver E. McCormick, Chicago, treasurer; Eustice J. Knight, Chicago, secretary, and O. C. Olpin, Salt Lake City, assistant secretary-treasurer. Members of the board are: Mr. Insull, Mr. Sharp, Mr. Horning, Mr. McCormick and E. V. Graham, E. A. Davis and P. J. Lucey, all of Chicago.

The company, in pursuance of its policy of expansion, has begun the publication of a monthly house organ. The publication has eight pages and will be enclosed with the monthly bill sent to subscribers. Fifty dollars is being offered by the company for a name for the publication, which is designed to secure the co-operation and support of the public and preserve a harmonious relationship between the company as a public utility and its subscribers.

S. E. Lowe Passes Away

S. E. Lowe, the youngest son of the late Professor P. S. C. Lowe, inventor of the Lowe Water Gas Process, passed away recently at his home in Houston, Texas. Mr. Lowe was actively engaged in the gas business throughout the West and Southwest and particularly concerned with the installment of gas plants.

Good Housekeeping Institute Endorses A. G. A. Specifications

Only gas ranges that comply with specifications set down by the American Gas Association will be approved by Good Housekeeping Institute, according to Arthur J. Donniez, of that body.

"The construction of a well-made range, and the performance of its burners will comply with the Standard Gas Range Specifications that have been adopted by the American Gas Association," Mr. Donniez says.

"This is a national organization made up of gas appliance manufacturers, men associated with the gas companies and representatives of allied industries. Through their combined efforts they have compiled specifications covering the kind and minimum thickness of metal to be used in the several parts of a range, the proper placing and supports of the burners and the performance of these burners.

"A range made in accordance with these is representative of good gas range practice. In testing all gas ranges at the Institute we follow these specifications, and only those that fulfill them are approved. With a gas range, as with other things, you get what you pay for. Ranges that are not built to meet these standards can, of course, be offered at a lesser price.

Northern Indiana Gas and Electric Co. Moves into New Building

Hammond, Ind. — The largest office building in Indiana to be occupied exclusively by one public utility company was opened here this week, when the Northern Indiana Gas & Electric Co. moved into its new $300,000 office building.

The building is three stories high and covers an L shaped area of 8,450 square feet, with frontage on two streets. It is built of Indiana limestone and brick and is designed to permit of two additional stories should more space be required.

The third floor is devoted to the general offices of the company, including the accounting department and the offices of the comptroller, purchasing agent and general storekeeper. The second floor is occupied by the executive departments, advertising, commercial lighting, industrial sales and general superintendent's offices and the industrial relations department of the general office.

The merchandise display room occupies a space about 70x50 feet on the main floor. The remainder of the floor is devoted to local office departments with which the public frequently deals.

A feature of the building is its gas-fired heating plant, which is the largest in any office building in northern Indiana. It is located in the basement and is open to inspection by the public. In the basement is also a men's recreation room and a cooking demonstration and lecture room, which will accommodate 100 people.

Powerful floodlight projectors which illuminate the two facades of the building at night make it an important addition to Hammond's business section.

This week has been set aside by the company as visitors' week and special guides have been assigned to conduct visitors through the offices and stores.

Russell Engineering Company Announces Permanent Change in Organization

At the time of the death of Mr. Vernon Baker, chief engineer of the Russell Engineering Company, St. Louis, Ill., Mr. Baker's work was undertaken by Mr. David Sutherland and Mr. A. Schleiffarth. This arrangement has now been made permanent. Mr. Sutherland is engineer in charge of design and operation and Mr. Schleiffarth is engineer in charge of construction.

Goshen (Ind.) to Get Gas

Elkhart, Ind.—Goshen will be connected with Elkhart by a gas pipe line ten and one-half miles long.

Gas manufactured in the plant of the Calumet Gas & Electric Co. in this city will be pumped to Goshen for distribution to the customers of the Interstate Public Service Company, which serves that city.

Work of laying the pipe line will commence within the next few days. The line will be built of six-inch wrought iron pipe, which will be welded together. The line will follow the Lincoln Highway between Elkhart and Goshen, and plans are made to give gas service to Dunlap, a small community between those cities, and to other residents along the highway.

The Calumet Gas & Electric Co. will own and operate that part of the line extending five and one-half miles east of Elkhart and the five miles of line west of Goshen will be owned and operated by the Interstate Public Service Co.

Construction of this gas pipe line is an application of the principle of distribution which has proved so successful in the electric light and power industry. It will mean extension of gas service to homes which otherwise would be unable to have the convenience of gas service.

As Goshen has storage facilities for more than a 24 hours' supply of gas, connection of its gas distribution system with a large gas manufacturing plant through a pipe line will make it possible for the Interstate Public Service Company to use its Goshen plant as a stand-by plant.

The Elkhart plant has a daily capacity of 1,290,000 cubic feet of gas and as the combined sales in Elkhart and Goshen average 850,000 cubic feet daily, there is ample margin for expansion of the business without the addition of new equipment.

The pipe line will be large enough to take care of additional growth in Goshen and vicinity for many years. The improvement will represent an investment of approximately $90,000 and it is expected that the work will be completed early in July.

East St. Louis to Furnish Gas to Woodriver

Woodriver, Ill. — Construction work will be started soon by the Illinois Power & Light Corporation for furnishing gas to Woodriver. Mains which will be laid here will be connected to pipes at Edwardsville, where the company is already furnishing service. The work will be completed in little over a year.

The Woodriver district will be connected with all systems in Southern Illinois which the Illinois Power & Light Corporation now serves. Under the company's arrangements the gas is obtained from the coke plants in Granite City and piped to East St. Louis, where it is purified and then distributed to consumers.

The plans for the gas system call for an eight-inch main to be laid from Edwardsville. It will parallel the Edwardsville road through Roxana and extend north on Sixth street to the junction with Madison avenue. Then it will turn west and follow the line of the Standard Oil Company refinery fence to the old St. Louis road. It will turn north along that road to East Alton. The system for distribution for Woodriver, East Alton and Roxana will be connected at the most advantageous points along the main line. A connection for Hartford will be made at the crossing of the Illinois Terminal Railroad tracks in Roxana.

Southern Counties Gas Co. Moves Its Main Office

Los Angeles, Calif.—The Southern Counties Gas Co. of California, since 1911 one of the active gas utilities of Southern California, and today a distributor of natural gas in five nearby counties, moved its general offices on May 31 to the new Los Angeles & Electric Corporation building, 810 So. Flower street, this city. The company is now occupying the entire sixth floor of that new structure.

One year ago the company moved from the Corporation building on South Spring street to the newly constructed National City Bank building, 810 So. Spring street.

The growth and expansion of this natural gas organization has been very rapid. Incorporated in 1911, the company at the end of its first year served approximately 6,000 consumers in cities adjacent to Los Angeles. With the development of the natural gas fields in Southern California the company turned this natural resource into its mains and today more than 50 cities and communities on its lines are being served.

The company has been especially aggressive in developing a power load in the agricultural districts near Los Angeles, known as the "Sunkist" belt. Here irrigators and agriculturalists use natural gas for developing water for irrigation purposes.

Today the company serves a population estimated at more than 500,000 people.

New Gas Plant for Fargo

Fargo, N. D.—The permit for a new $150,000 gas plant for Fargo, the construction of which will be begun within 60 to 90 days, and which it is expected will be completed by the end of the year, has been secured from the Fargo building inspector by the Union Light, Heat & Power Company.

The growth of Fargo compels the new structure, the company announces.

The definite announcement of this project adds another big item to the year's building program in Fargo, and it is understood that other extensive improvements are

contemplated by the Union Light, Heat & Power Company for this year.

No other details are yet ready for announcement, but when the tentative building plans for the year in the Northwest were announced by the Byllesby interests some weeks ago it was understood that the Fargo program called for expenditures considerably greater than announced. Company officials state that other improvement plans may be expected soon.

Atlanta Gas Men Attend Southern Convention

At least two Atlanta men occupied prominent places on the program of the 17th annual convention of the Southern Gas Association, which met in Wilmington, N. C., on June 9. The two were C. J. Weinmeister, superintendent of distribution for the Georgia Railway & Power Co., and E. D. Brewer, of the Ruud Manufacturing Company, of Atlanta.

Mr. Weinmeister, speaking on the subject of "Gas Distribution," contributed the results of a lifelong study of this technical branch of the industry, and Mr. Brewer, speaking on the subject of the increased sale of gas, cited figures to show that the South was the most prosperous section of the country.

Mr. Brewer in his speech pointed out that the gain in cubic feet of manufactured gas sold in the South during the 10 years from 1913 to 1923 was 116 per cent, as compared with a gain of 104 per cent for the period in the United States as a whole, and stated that the South offered by far the best field for the manufacture of gas.

Among those attending the meeting from Atlanta were, in addition to Mr. Weinmeister and Mr. Brewer, M. L. Kane and A. D. Whitaker. Others in the Georgia delegation were Fielding L. Marshall, of Augusta; J. A. P. Crisfield, of Savannah, and John H. Hagerty, of Valdosta. All are prominent in the industry and are officials of the local gas association.

Public Service of N. J. Installs Gas Holder

Bayonne, N. J.—One of the largest gas holders in the world has been placed in position at the Harrison plant of the Public Service. The holder, which is of the latest type, required the services of more than 150 men to place.

Gas Plant for Counties Gas & Electric Co.

A carburetted water gas plant and necessary buildings will be erected at the West Conshohocken Gas Handling plant during the coming spring by the Counties Gas & Electric Company. This undertaking will involve an expenditure of more than $400,000.

The initial unit to be built will have a capacity of 2,500,000 cubic feet a day. Work on the generating house will be started in a few days and two additional units will be installed, to have an ultimate capacity of more than 10,000,000 cubic feet a day. It is the intention of the company to ultimately discontinue the plants at Norristown and Ardmore for manufacturing purposes, utilizing both as distributing centers only, they to be interconnected with the local manufacturing plant.

Oakville, Ont., to Have Gas

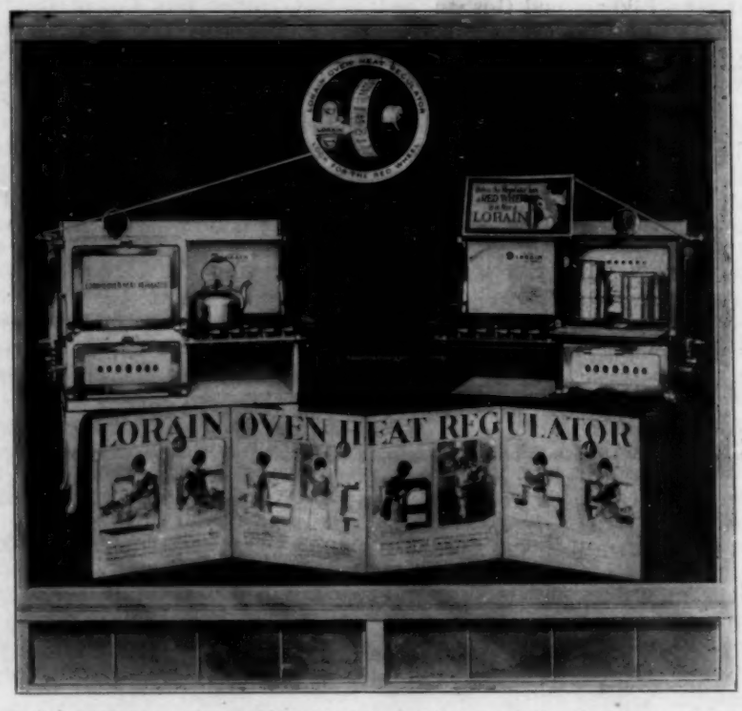
The town of Oakville, Ont., will have gas in the near future. The plant proposed is the Tulley Gasification Process. The plant will be erected by a firm of English gas plant manufacturers and the distribution system, mains, etc., will be completed by contract, for which the opportunity exists for contracting companies of America.

The Oakville Town Council, at a recent meeting, were unanimously in favor of granting the necessary franchise and the residents of the town, numbering 8,000, are keen on having gas service. The proposed plant will supply gas of 460 B.t.u., which will be sold at $1.25 per thousand feet. About three acres will be occupied by the plant, including the gas holder.

The plant will have a capacity of 300,000 cubic feet per day, with provision for future expansion.

The Tulley Gasification Process as proposed will yield 45,000 to 50,000 cubic feet of gas per ton of coal.

A committee of Town Councilmen recently made a tour of inspection to other towns in Ontario, where the Tulley process was used, and later reported that they were convinced of the merits



An Example of a Well Gotten-up Display of Gas Ranges